UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 10 1989

MEMORANDUM

OFFICE OF WATER

SUBJECT: Shallow Injection Well Program Strategy

FROM: Rebecca W. Hanmer, Acting Assistant Administrator for Water

TO: Regional Water Division Directors
Regions I-X

I am pleased to release the "Shallow Injection Well Program Strategy" for your use in administering the Underground Injection Control Program with your States. The vast number and diversity of these wells, their contamination potential, and variation in current State and local approaches and practices to address the problem prompted the development of this Strategy to provide overall direction for the program.

The control of shallow injection activities is becoming a central component of an integrated approach to protect the quality of groundwater resources. This national approach involves setting priorities by considering the degree of threat to underground sources of drinking water and establishing a corresponding level of control. Those subcategories of wells with a high potential to threaten public health will be regulated earliest and most stringently.

The Strategy has been influenced by the proposed TCLP rule which will expand the number of hazardous wastes and will probably cause large numbers of high priority shallow injection wells to be reclassified as Class IV wells and be banned. In this case, these wells will not require new regulation, but rather an effective implementation program to find, close, remediate, and if necessary, enforce against these well sites. A separate implementation guidance is under preparation to address this specific problem.

There are seven basic components to this Strategy as briefly described in the Purpose and Introduction, and Regions and States have a central role in implementing each of these components.

The next year is very important to the success of this program and I am looking forward to your continued support.

SHALLOW INJECTION WELL PROGRAM STRATEGY

I. PURPOSE AND INTRODUCTION

This shallow injection well program strategy describes EPA's overall approach to addressing shallow injection wells (i.e., inject into or above an Underground Source of Drinking Water). The Agency will consider a full range of regulatory and non-regulatory actions for these wells, with the level of control directly related to the threat posed by the type of well. Many of these wells may prove to be Class IV wells, and subject to immediate closure under present regulations. Many more may become hazardous waste disposers when the new Toxicity Characteristic Leaching Procedure (TCLP) rule takes effect. All hazardous waste wells which inject into or above an Underground Source of Drinking Water (USDW) are Class IV and must be closed. An effective program must be developed to ensure the identification, closure, and remediation of these wells. The complexity and magnitude of the remaining shallow injection well universe requires the establishment of priorities for when and how each subcategory will be addressed. It may be that the remaining wells which do not endanger USDWs may require only federal guidance and standards, rather than further regulation. There are seven basic components of this strategy:

1. Identify that portion of the shallow injection well universe of wells that are or will become Class IV wells and develop a program of identification, inspection, notification, closure, remediation, where necessary, and enforcement.

2. Develop and analyze through public forum a wide range of options for enhancing the overall Federal and State regulatory and programmatic framework for controlling shallow injection wells.

3. Identify those subcategories of wells for which additional technical guidances are necessary and publish such guidance.

4. Identify, fund and track demonstration projects to transfer experiences nationwide and to produce data and information to support appropriate controls and initiatives.

5. Identify other Federal, State and sub-state authorities and program activities that are related to shallow injection well objectives and work to integrate these activities.

such as well-head protection and other groundwater protection programs, can support and/or direct certain shallow injection activities by identifying vulnerable aquifers and establishing protection priorities.

In addition to the Safe Drinking Water Act, there are other federal regulatory authorities which can be used to address the shallow injection well problem. These include the Clean Water Act, the Resource Conservation and Recovery Act, the Surface Mining Act and the Geothermal Act. The Analytical Process For Making Shallow Injection Well Program Decisions (Appendix) will include a thorough review of these authorities and an integration of all appropriate controls.

The number and diversity of shallow injection wells, their range of contamination potential, and the variation in current state and local approaches to address the problem has prompted further examination at the federal level. The control of shallow injection well injection activities is becoming a central component of an integrated approach to protect the quality of groundwater resources. This national approach involves setting priorities by considering the degree of threat to underground sources of drinking water and establishing a corresponding level of control. Those subcategories of shallow injection wells which may inject hazardous waste will be identified, verified and closed. Penalties may be assessed in association with any enforcement action. The remainder will be prioritized and addressed by their potential to pose a threat to public health.

A vital component to the successful establishment of a regulatory program for shallow injection wells is building a well informed constituency through communication and outreach activities. Few people are aware that these wells are "wells" controlled by the Safe Drinking Water Act or that they pose a public health threat. EPA and all other levels of State and local government have a responsibility to inform and educate the public. A separate but related communications and outreach plan has been prepared to accomplish this.

III. The Strategy at a Glance

The Agency completed the Report to Congress in September 1987, and has continued to operate the shallow injection well program under present regulations while using this time to gain experience with the program and to develop the strategy and analytical process as attached in the Appendix.

The strategy has been influenced by the expected promulgation of the TCLP rule which will expand the number of hazardous constituents and will probably cause a large number of the high priority shallow injection wells to be reclassified as Class IV wells which are banned. In this case these wells will

categories in detail and is expected to project the number (national estimate) affected by this new rule. If promulgated on the current schedule (November 1989), the effective date of this regulation will be May 1990 (six months after promulgation). Draft guidance for enforcing the ban on these wells will be available in December 1989 with final guidance in April 1990.

Enhance the Federal, State and Local Regulatory Framework

Given the diversity, complexity and ubiquitous nature of the shallow injection well universe (possibly upwards of one million wells nationwide), the Office of Water has elected to develop an options paper (to be available November 1989) and present it for critique in public forum. The paper will discuss how best to enhance the regulatory and programmatic framework for bringing high priority wells into compliance. Options to be considered will include but are not limited to: 1) promulgating a general regulation with specific fixes covering all types of shallow injection wells (i.e., an enforceable but stringent standard with provision for variances); 2) establishing more stringent requirements to maintain or obtain State primacy for shallow injection wells; 3) preparing regulations on a priority well category-by-well category basis, augmented by additional guidance; and 4) specific guidance for individual or groups of well categories on a priority basis. The options selection process is expected to be completed in mid FY 1990.

While this process carries forward, the program will continue to use the Class V Enforcement Guidance Number 62, dated April 28, 1988, augmented by technical guidance where available, to focus attention on those categories of shallow injection wells deemed to be high priority based on health risk. Attention will be focused on addressing those wells in proximity to public and private drinking water supplies.

Issue Technical Guidances and Regulations

The Office of Drinking Water has developed a seven step "Analytical Process for Making Shallow Injection Well Program Decisions" (see the Appendix), designed to answer the following questions and consider all appropriate alternatives at each step:

- What are the worst practices?
- What are their environmental impacts?
- How are they currently controlled?
- If injection is allowed, what requirements and restrictions should apply?
- How should the requirements be imposed?
- How can compliance be assured?
- Who should regulate?

Group 6 -- Untreated Sewage (5W09), Cesspools (5W10), Undifferentiated Septic Systems (5W11), Septic Systems with Wells (5W31), Septic Systems with Drain Fields (5W32) and Domestic Waste Water Treatment Plant Effluent Wells (5W12)

This group is also very large in number and the total loading to groundwater is probably the largest of all shallow injection well groups.

Group 7 -- Recharge Wells (5R21)

This is an increasing practice that can be significantly impacted by the source of recharge water.

As work proceeds on these wells, a central file of issues, relevant discussion summaries and resolutions will be maintained.

Undertake Demonstration Projects

The Report to Congress on shallow injection wells and the supporting state reports provide limited data on inventory, contamination potential and current regulatory practices for shallow injection wells. Any currently ongoing demonstration or pilot projects which might provide additional data or information useful for strategy development and program implementation will be identified and a tracking system implemented by February 1990.

In addition, EPA anticipates $1,000,000 in FY 1990 UIC grant funds will be used specifically for demonstration projects for the priority subcategories. These projects will: 1) test innovative approaches for managing shallow injection wells that would be broadly applicable by transferring experiences to other state and local governments; and 2) generate data and information to help in implementing our strategy and guidance for priority subcategories of wells. EPA issued guidance in June 1989 to establish the results expected from these shallow injection well demonstration projects, the eligibility and project criteria, proposal content requirements, and the process that will be used to select the demonstration projects. The deadline for submitting proposals was August 30, 1989. A review team has reviewed and ranked all proposals. Final decisions will be made by the Director, Office of Drinking Water, in early FY 1990 and advices of allowance will be issued shortly thereafter. Data and information from these projects should be available during FY 1990 and FY 1991.

In addition, as regulations or guidance are developed for each of the shallow injection well subcategories, a specific communications strategy will be developed and implemented to inform the owners and operators, and the general public of responsibilities for public health protection. The Office of Drinking Water will target national associations and groups for each subcategory of well, and will work with the regions and states to identify appropriate constituencies at the regional, state and substate level. Information needs will be jointly determined, and existing informational materials will be reviewed and shared as appropriate. New materials, including brochures, issue briefs and slide presentations, will be produced by headquarters; regions and states will tailor these materials as appropriate to meet their specific needs. This strategy also envisions asking groups and associations to train and provide technical assistance to their constituencies if they have or can develop the capability. The strategy for information exchange with the targeted groups will be jointly determined by headquarters, the regions and states.

Consider Legislative Initiatives

EPA's knowledge about shallow injection wells has expanded significantly over the last several years. This knowledge, coupled with state and local experience in controlling these wells, may identify needs for statutory changes within the Safe Drinking Water Act. Changes or clarifications which address the differences between shallow injection well and other well classes could provide greater efficiencies in the regulatory process and implementation of controls. EPA will identify a preliminary list of any legislative initiatives and develop issue papers as appropriate. The issues will be refined and expanded as necessary and supporting documentation will be prepared. As appropriate, Congressional briefings will be offered. These efforts will be carried out under the guidance of the Deputy Administrator's Groundwater Strategy Task Force.

V. ROLES AND RESPONSIBILITIES

Headquarters

The primary role of EPA headquarters in the Shallow Injection Well Program is overall management and national leadership. The Office of Drinking Water sets the tone and direction for the program. Responsibilities include development and implementation of national program strategies, development, issuance and enforcement of regulations and program guidance documents, coordination and integration of activities with other headquarters program offices, technical assistance and financial support to state and EPA regional program activities, support and promotion of outreach and communication initiatives, and program oversight.

The UIPC Research Foundation will assist in identifying and defining, and may even fund, demonstration projects designed to produce data needed for EPA guidance and regulatory development.

Other Organizations

EPA will identify other organizations needed to reach the shallow injection well constituency groups as part of the various communications strategies and will work with these groups as appropriate to support shallow injection well information and implementation activities.

SECOND PRIORITY LIST

5X16 -- Spent Brine (121)
5A05 -- Electric Power (89)
5A06 -- Direct Heat (21)
5A07 -- Heat Pump (10,028)
5A08 -- Aquaculture (25)
5X13 -- Backfill (6,500)
5X14 -- Solution Mining (2,025)
5X15 -- Fossil Fuel (66)
5X17 -- Air Scrubber (not known)
5X18 -- Water Softener (not known)
5A19 -- Cooling Water (291)
5B21 -- Barrier (157)
5S23 -- Subsistence Control (4)
5X25 -- Experimental Technology (225)
5X27 -- Other (not known)
5X29 -- Abandoned Water Well (3,050)
5G30 -- Other Drainage (1,557)

() Report to Congress inventory. Other inventories do not contain all 32 subcategories. The numbers are low based on other estimates.

APPENDIX

ANALYTICAL PROCESS FOR MAKING SHALLOW INJECTION WELL PROGRAM DECISIONS

OCTOBER 1989

WHAT ARE THE WORST PRACTICES?

WHAT ARE THEIR ENVIRONMENTAL IMPACTS?

WHAT CONTROLS ARE IN EFFECT?

CAN INJECTION BE ALLOWED?

WHAT REQUIREMENTS WILL APPLY? WHAT FORM WILL THEY TAKE?

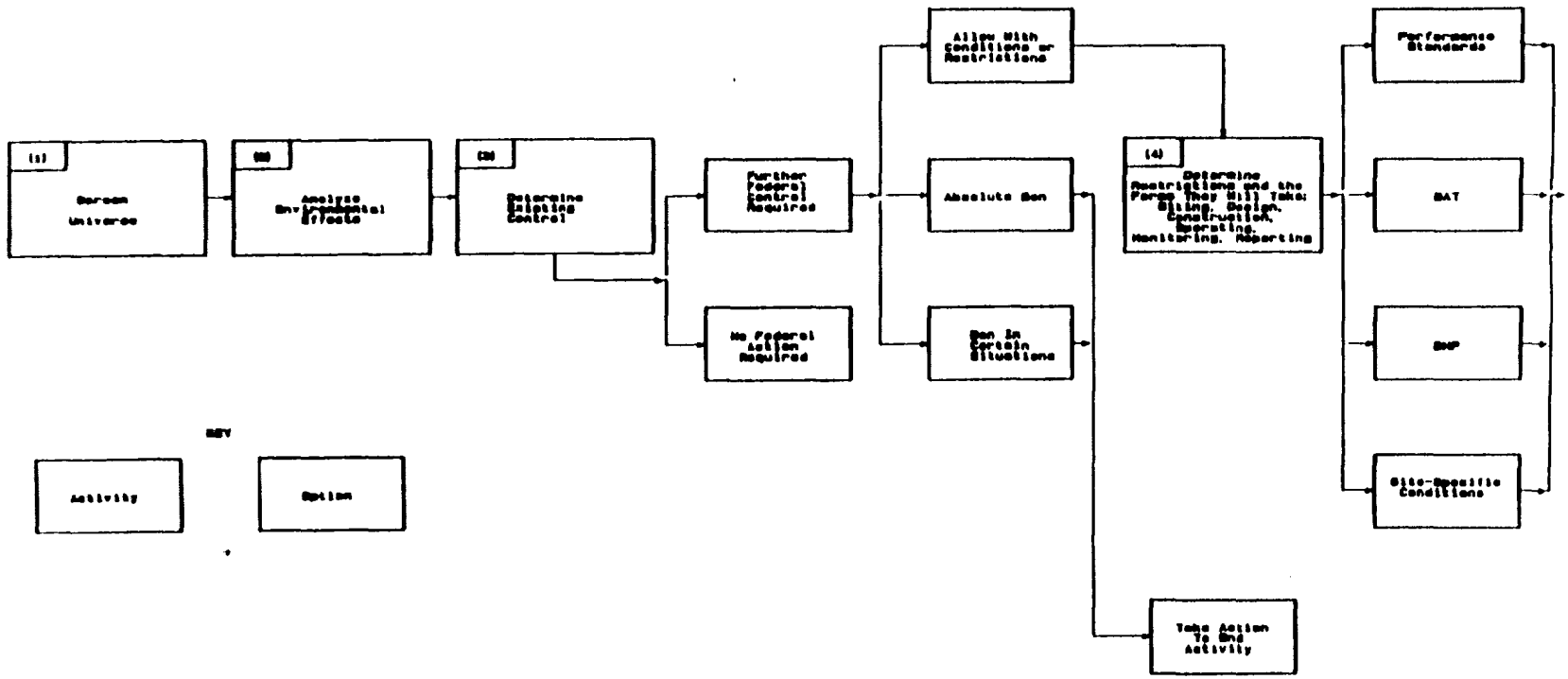

FIGURE 1: ANALYTICAL PROCESS FOR MAKING CLASS V REGULATORY DECISIONS

analysis will help EPA decide whether further Federal controls are required.

The six-step analysis of environmental impacts, presented in Figure 2, considers:

- o quality of raw fluid,
- o level of waste treatment,
- o quality of injectate,
- o effects of injection on the aquifer,
- o location of injection, and
- o proximity to use.

In some cases, EPA may decide that injection poses little threat to human health and therefore, no further action is required. EPA would continue to address problem wells in these cases on an individual well basis. If further control is necessary, EPA has three choices for recommendations on guidance:

- o absolute ban,
- o ban in certain circumstances, or
- o allow with conditions or restrictions.

The first of these would be used to prevent shallow injection activities that the six-step environmental analysis demonstrates are most likely to contaminate an Underground Source of Drinking Water.

EPA may choose to urge a ban on wells within a shallow injection well subclass if the injectate exceeds maximum contaminant levels or otherwise endangers the health of persons and the injection is:

- o within the zone of contribution of a PWS well or well fields,
- o in a high density use area,
- o within a Class I/II aquifer recharge area, or
- o in karst or similar geology.

Banning wells meeting these characteristics would prevent the endangerment of drinking water sources.

Shallow injection wells that are allowed to continue injecting with conditions or restrictions would be analyzed further in the next phase of the regulatory decision making process.

3. Determine Existing Controls

Before establishing the types of Federal restrictions suitable for shallow injection wells, EPA will examine relevant State and substate statutes and ordinances. The purpose of this inquiry is to determine whether:

- o a State or substate regulation could be effectively implemented on a National scale, and
- o a well subcategory is sufficiently controlled at the State or substate level such that no further Federal control recommendations are necessary.

If EPA determines that a well subcategory is already being effectively regulated at the State or substate level, then that subcategory may have no further recommendations, provided that States:

- o continue regulating these wells, and
- o assure that these wells do not endanger underground sources of drinking water.

4. Determine Restrictions and the Forms they will take: Siting, Design, Construction, Operating, Monitoring or Reporting

Having identified wells in need of further controls, the Agency must identify appropriate restrictions. Regulatory or non-regulatory controls may be recommended in guidance using:

- o performance standards,
- o technological standards,
- o best management practices, and/or
- o site-specific conditions.

Performance standards would require owners and operators to meet certain minimum requirements for either injectate quality and quantity or the mechanical integrity of the well. Technological standards specify minimum well construction requirements involving:

- o well depth and diameter,
- o well casing tubing and liner materials,
- o packers,

Registration may be either enforceable or voluntary. The UIC regulations currently require well owners and operators to submit inventory information on location and well characteristics (40 CFR Part 144). A registration requirement would formalize this procedure and may require more detailed information. Registration may be used effectively by the States in conjunction with one or several of the other methods listed above.

All shallow injection wells for which inventory information was filed are currently authorized by rule. EPA may continue to authorize by rule when it is unlikely that a particular injection practice will endanger USDWs. Possible candidates for authorization include:

- o wells that are remote from USDWs,
- o highly reliable types of well construction,
- o wells sited in appropriate geological areas,
- o wells injecting innocuous or low mobility substances, and
- o wells injecting beneath the USDWs.

EPA may publish performance-based or technology-based standards for other wells which may contaminate a USDW or pose a threat to public health. Published requirements might also take the form of best management practices.

Another option is a policy statement issued to State primacy agencies, enabling States to establish programs to address their unique problems while adhering to stated Federal policy.

The Agency may choose to issue guidance. There are two types of guidance: (1) regulatory guidance which is written in response to regulatory standards, and (2) non-regulatory guidance which provides education and assistance. Guidance can be given to State or local programs on appropriate regulatory approaches and standards or to allow shallow injection well owners and operators on Best Management Practices (BMP).

EPA can issue the following types of permits:

- o Individual permits,
- o Area or project permits, and
- o General permits.

Another option is publishing requirements without reporting provisions and conducting random facility inspections. This procedure is used by EPA for spill prevention, control, and countermeasure plans under the authority of section 311 of the Clean Water Act.

EPA may also ensure compliance using non-regulatory procedures. The first of these, which has proven effective in other programs, is training. It may be useful to provide technical assistance to owners and operators on the problems associated with inappropriate injection. For example, service stations may use shallow injection wells to dispose of wastes that could be discarded in another inexpensive yet environmentally sound manner.

Outreach may also be a useful component of the Agency's plan for promoting compliance. Education about the risks associated with shallow injection wells may encourage the public to support State or local government efforts to address these problems. In addition, EPA may establish outreach programs to solicit the support of local government agencies in controlling shallow injection wells.

The Agency may provide financial incentives, such as user fees, to encourage dischargers to reduce injected pollutants. EPA may also establish cooperative agreements with lending and insurance agencies so that prevention of shallow injection well problems is addressed in existing and/or new insurance or lending agreements with owners and operators.

Any of these approaches may be pilot tested, before they are implemented on a large scale. In addition, pilot projects may be a useful outreach tool.

EPA may want to enlist the support of other government agencies, public interest groups, and trade associations in implementing non-regulatory options. The following organizations should be considered: the Soil Conservation Service, the Department of Energy, the Nuclear Regulatory Commission, the Department of Agriculture, the Department of Defense, local zoning boards, building inspectors, environmental groups, and the National Rural Water Association.

8. Determine Who Should Impose and Assure that Requirements are Met

A number of Federal, State and local programs may be appropriate for controlling a particular well subcategory. EPA may choose among Federal, State and local authorities for each well subcategory.